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The Economics of Rice Policy in Four Developed Nations

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# THE ECONOMICS OF RICE POLICY IN FOUR DEVELOPED NATIONS\*

by

James P. Houck\*\*

About 90 to 95 percent of the world's rice is produced in nations generally classified as economically less-developed. Yet much of the rice moving in international trade is exported by wealthier, developed nations. Similarly, a sizeable share of world rice imports is taken by economically-advanced countries.

Several of these developed nations which export and import rice employ protective policies designed to shield their own rice producers from the full force of international competition. Generally speaking, these policies transfer income from consumers or taxpayers to rice producers and, in doing so, stimulate output and narrow international markets available to other trading nations. Consequently, the rice policies of developed nations are of special interest and concern to rice trading nations in the less-developed world, particularly those in Asia.<sup>1/</sup> Among these Asian nations, Thailand obviously has a large stake in the economic effects of these rice policies.

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<sup>1/</sup> A series of papers covering rice policy in most of the important less developed producing and trading nations is contained in the volume cited in (7). (The numbers in parentheses refer to similarly numbered items in the References section at the end of this paper.)

The purpose of this paper is to present and discuss the economic core of the protective rice policies in four major developed nations; the United States, Australia, Japan, and the European Economic Community (EEC).<sup>2/</sup> The fundamental economic aspects of rice policies are emphasized and not their operational details and statistics. The main purpose is to show how these policies protect domestic rice producers and to suggest how they may impinge upon world trade. The analytical tools are simple economics of static partial equilibrium together with some discussion of the economic and political setting within which the policies function.

Before turning to the rice policies of these four nations, let us quickly look at their position in the world rice economy, table 1. First, these four nations collectively accounted for only 7.4 percent of global rice production in 1969-70, but 42.0 percent of world exports. The United States produced about 1.3 percent of the world's rice but shipped 28.7 percent of all world exports. Australia produces an almost negligible proportion of the world's rice but exported 1.8 percent of world trade in 1969-70. Japan, the major rice producer and consumer among developed nations, accounted for 5.7 percent of world production in 1969-70 and 7.4 percent of total exports. But Japan is not a traditional exporter of rice. Until quite recently, she was a major importer. The EEC both imports and exports rice. It is a net importer, however, with long-grained rice moving into the Community in excess of the short-grained volume which is exported.

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<sup>2/</sup> The six-nation European Economic Community now operates under a Common Agricultural Policy which includes rice. For the purpose of this paper the EEC will be regarded as a single "nation". Currently, the full members of the EEC are France, The Netherlands, Belgium, Luxembourg, The Federal Republic of Germany, and Italy.

Table 1:

Rice; production, exports, and imports of four developed nations, average 1969-1970

| Country                | Production <u>a/</u>    |                           | Export <u>b/</u>        |                           | Import <u>b/</u>        |                           |
|------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|
|                        | thousand<br>metric tons | percent of<br>world total | thousand<br>metric tons | percent of<br>world total | thousand<br>metric tons | percent of<br>world total |
| United States          | 3,940                   | 1.3                       | 1,830                   | 28.7                      | ---                     | ---                       |
| Australia              | 268                     | 0.1                       | 117                     | 1.8                       | ---                     | ---                       |
| Japan                  | 17,332                  | 5.7                       | 473                     | 7.4                       | 38                      | 0.6                       |
| EEC                    | 983                     | 0.3                       | 260                     | 4.1                       | 366                     | 5.7                       |
| Total<br>(4 countries) | 22,523                  | 7.4                       | 2,680                   | 42.0                      | 404                     | 6.3                       |

a/ Paddyb/ Milled riceSource: Food and Agriculture Organization of United Nations  
U.S. Department of Agriculture

Japan and United States are clearly important in the global rice economy in terms of production and trade respectively. Australia and the EEC may appear to be unimportant. Yet changes in the rice policy of either one of these nations can add to or detract from the strength of the international rice market in any given year. Within these four nations, decisions to reduce protection of rice growers by the liberalization of imports or by reduction of export subsidies or price guarantees would add strength to markets for exporters like Thailand. Similarly decisions to increase protection by reducing imports or by expanding subsidized exports would further weaken an already-depressed international market. Since each of these four nations is wealthy enough to afford income transfer from one sector to another, decisions regarding rice policy will continue to be political as well as economic.

For each of these four nations, production, trade, and price policy for rice is generally consistent with and influenced by policies for other food grains, principally wheat. It is beyond the scope of this paper to analyze the entire range of food grain policies among these nations. Attention is focussed on rice policy, but the interrelationships between other food grains and rice should not be forgotten.

#### Price Comparisons

Although international price comparisons are always risky, the 1969 data in table 2 at least suggest the relative magnitudes of difference between farm level rice prices in the four developed nations and the wholesale paddy price in Thailand.

Table 2:

Paddy prices in United States, Australia,  
Japan, EEC, and Thailand, 1969.

| <u>Item</u>  | <u>U.S. Dollars per<br/>Metric ton of paddy</u> |
|--|---|
| United States (average price rec'd by farmer)      | \$ 106.94                                       |
| Australia (average return to growers)              | \$ 69.76  |
| EEC (Gov't purchase price, Italy and France)       | \$ 125.00                                       |
| Japan (gov't-guaranteed producer price, bagged)    | \$ 242.82                                       |
| Thailand (average wholesale price, No. 1, Bangkok) | \$ 57.67  |

Source: Food and Agriculture Organization of United Nations

U.S. Department of Agriculture

Rice Marketing Board of New South Wales

The prices in the four developed nations reflect the net impact of price and trade policies in behalf of rice growers. The Thailand price reflects the impact of a heavy export tax which has since been mostly removed. In addition, Australia, EEC, and Japan produce mainly short-grained rice varieties. The United States produces both short- and long-grained rice, and Thailand is a large producer and exporter of long-grained rice. Prices naturally reflect these differences.

Notice the high supports available to Japanese rice producers. Intermediate and lower levels of price protection are offered to EEC, U.S., and Australian producers. The policy mechanisms which sustain these price levels inside the four developed nations are discussed in the following sections.

#### United States

Rice policy in the United States can be summarized as a price-support, acreage control program combined with commercial export subsidies and concessional food aid exports. (6, 12, 13) Figure 1 illustrates the economic framework of U.S. rice policy as it has operated recently.<sup>3/</sup>

Price supports through non-recourse loans are offered to growers at PS provided that they abide by acreage allotments and related marketing quotas. These allotments and quotas are designed to keep the national supply function, S-S, near the position desired by policy-makers (indicated by the arrows). In some years they are tightened to restrict the

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<sup>3/</sup> No implication of elasticities or actual price levels is intended in figure 1 or subsequent illustrations. However, the relative market sizes, indicated along the quantity axis are approximately realistic.



movement of S-S to the right. In other years, they are relaxed to permit increased production. A given national acreage allotment is, of course, continually eroded by advances in production technology which increase per acre rice yields. The national acreage allotment is divided among producers based mainly on past production experience. Individual allotments are concentrated in the southern and western states, principally Arkansas, Louisiana, Texas and California. Given the national supply function, S-S, and price support, PS, the amount Q3 is produced.

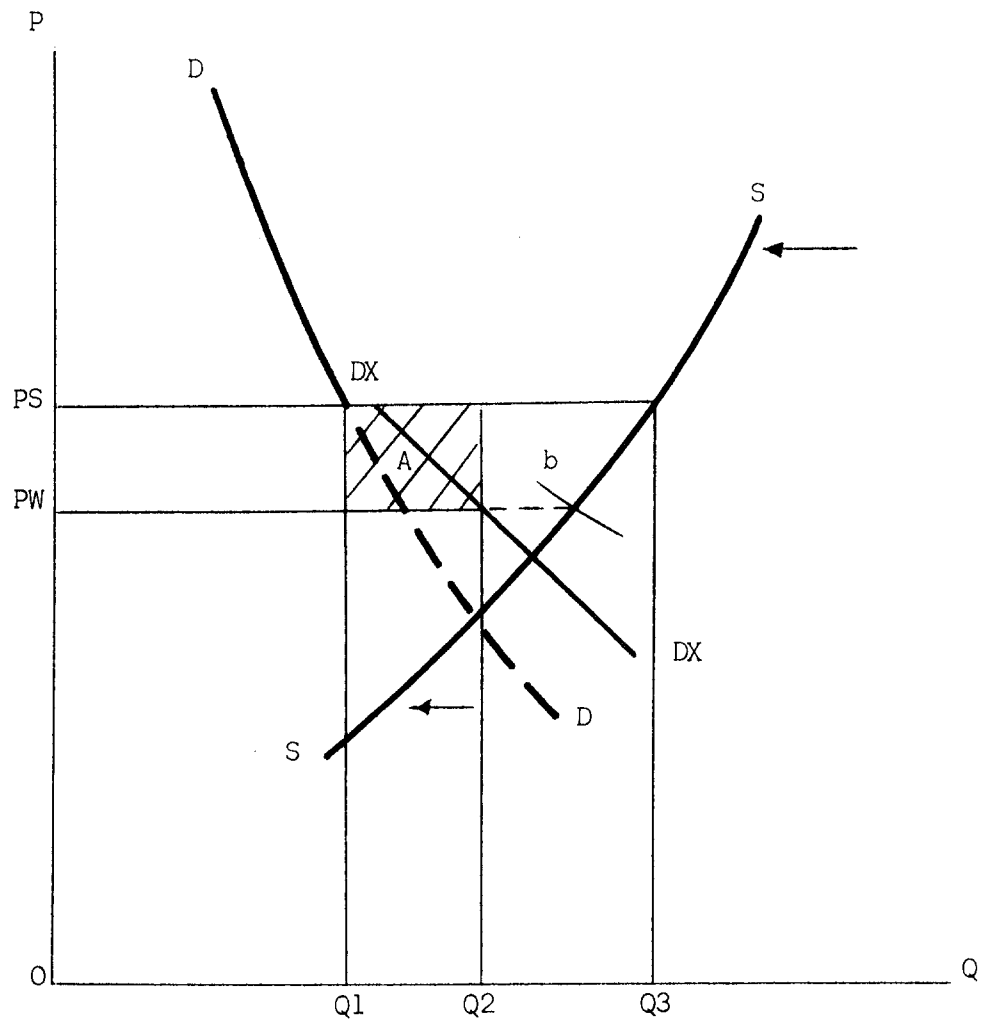
The curve D-D in figure 1 is the U.S. domestic demand function with prices of related goods, income, and other factors held constant. It is assumed to reflect demand conditions at the same marketing level as S-S so as to avoid the complication of spanning one or more levels of marketing. At the price of PS, Q1 moves into domestic consumption. The balance of the supply, Q3-Q1, is available for export and for inventory. Domestic disappearance usually amounts to one third to one half of total supply.

The curve DX-DX is the demand for US exports at export prices below PS. The horizontal distance between DX-DX and the vertical line at Q1 measures the amount demanded by foreign buyers at various prices. Since the United States supplies about 30 percent of world rice exports, it may be assumed that this export demand is not perfectly elastic at the world price but is a negative function of price.<sup>4/</sup>

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<sup>4/</sup> Even if the United States is assumed to be a perfect competitor on world markets on the basis of its relatively minor role in total production of rice, none of the essentials are changed. In fact, they are much simpler, especially the question of setting the export subsidy. The subsidy is then simply PS-PW, where PW is the externally determined world price. It is also assumed here, although it is by no means certain, that the United States would remain a rice exporter under a free market with no special export programs.

Figure 1: Rice Policy, United States



Commercial exports of rice from the United States carry an export subsidy to bridge the gap between high domestic prices and lower world prices, PW. In figure 1, commercial exports are shown as  $Q2-Q1$ , the export subsidy is  $PS-PW$  per ton, and area A is the total amount of subsidy paid. Approximately half of the excess supply at PS is exported commercially, mainly to Canada, Europe, and the Republic of South Africa.

Because the United States is assumed to be able to influence the level of world prices by changing its export volume, the establishment of the export subsidy becomes a delicate policy issue. Figure 1 is drawn to illustrate a stated objective of U.S. rice policy, namely the avoidance of an international price war over rice exports. (12) If the United States had no price support policy for rice, point b would be the equilibrium position for price and output in the free market. This is because the unlabeled curve intersecting S-S at b is the total demand facing the United States at equalized prices in domestic and export markets. It is the horizontal sum of D-D plus DX-DX, the latter evaluated between the curve and  $Q1$ .

Figure 1 is then drawn on the very strong assumption that U.S. policy makers actually do set the commercial export subsidy so that PW is the same as with free markets. Too large an export subsidy or too aggressive a sales campaign for commercial exports would widen the export volume measured by  $Q2-Q1$  and depress PW below point b. A lower export subsidy or a lower level of commercial exports would shrink the amount measured by  $Q2-Q1$  and PW would rise above b. The truth of the matter in the real world may be either way in any given year. Only empirical research with correctly measured demand and supply elasticities could settle the issue. However, the very existence of an export subsidy on rice suggests a downward pressure on world prices and leads to controversy with other commercial rice exporters.

Some of the remaining excess supply, Q3-Q2, is carried over as inventory, but a large amount is exported under the U.S. food aid program, commonly called Public Law 480. In recent years, the bulk of P.L. 480 rice exports have gone to Indonesia, the Republic of Korea, and Vietnam. A guiding principal of the P.L. 480 program is that concessional shipments should not replace commercial sales for U.S. rice or commercial sales of other rice exporters. Although genuine efforts are made to avoid displacing commercial sales, some displacement likely occurs. This displacement has the effect of shifting DX-DX to the left for the United States and also for other exporters. Thus, PW is probably somewhat lower than it would be if P.L. 480 shipments were not being made, given a fixed level of commercial exports from the United States.

The backflow of low priced imports into the higher-priced U.S. market is prevented by a fixed tariff of 2.0 cents pound of milled rice (approximately \$44 per metric ton). (14)

The protective aspect of this policy mechanism is that fluctuations in DX-DX caused by changes in demand and/or supply schedules around the world do not have an immediate or direct impact on the prices received by U.S. rice farmers. Consumers in the United States pay higher-than-world prices for rice, and U.S. taxpayers sustain costs for P.L. 480 shipments and for overall program administration. More rice is produced in the United States than would be true under free market conditions, although sizeable reductions in rice output have been made recently through acreage allotment cuts. (6, 12)

The following tabulation includes the approximate values of the quantities indicated of figure 1 for the average of 1969 and 1970 crop years in the United States: (13)

| <u>Item</u>                                      | <u>Thousand metric tons<br/>of milled rice</u> |
|--|--|
| Domestic disappearance (Q1)                      | 1,208  |
| Commercial exports (Q2-Q1)                       | 800  |
| P. L. 480 exports plus stocks (Q3-Q2)            | <u>992*</u>                                    |
| Total supply (Q3)                                | <u>3,000</u>                                   |
| * Average P. L. 480 exports in 1969-70 were 968. |  |

In summary, the U.S. rice policy protects domestic growers by means of direct price supports, export subsidies, and concessional shipments to foreign nations under government programs. In return, U.S. growers must abide by acreage allotments and marketing quotas which tend to reduce the growth of output. Consumers in the U.S. pay more for rice than under free market conditions.

#### Australia

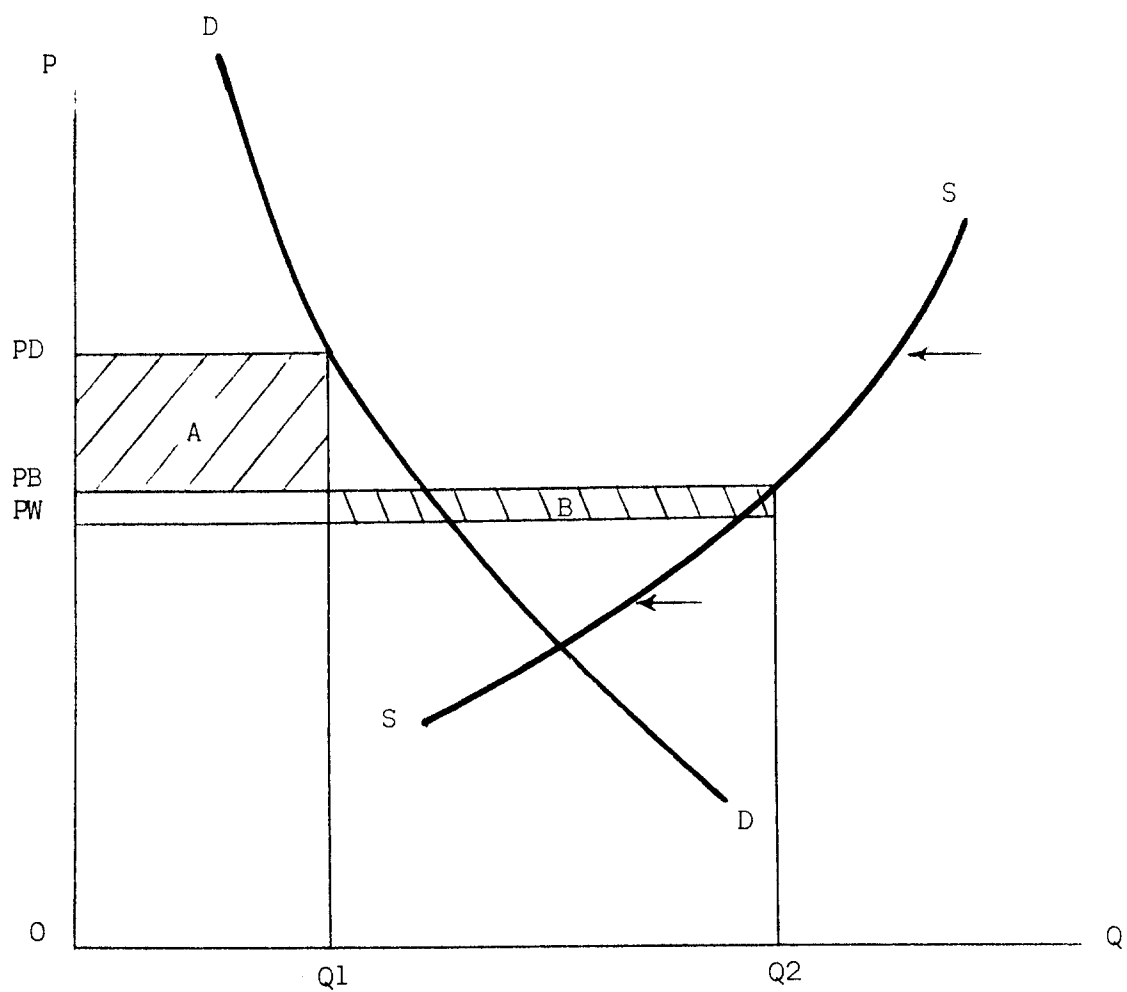
Rice policy in Australia is quite similar to Australian policy for many other export commodities. The main device is a higher home consumption price, a lower export price, and an intermediate level of prices to farmers (3, 9). As with several other farm commodities, a statutory marketing board (Rice Marketing Board of New South Wales) controls the flow of supplies to domestic

and export outlets and, in doing so, permits a slightly higher-than-world price to be paid to farmers. Supply control is practiced through acreage restriction based on access to irrigation water. The geographical concentration of rice production in southwestern New South Wales facilitates both production and marketing regulation.

In figure 2, the controlled supply function is shown as S-S, its position influenced by acreage allocations regulated by the state irrigation authority (N.S.W. Water Conservation and Irrigation Commission) in consultation with processor and marketing groups. At the pooled farm price of PB, Q2 is produced and marketed. The marketing board regulates the domestic supply at Q1. This supply earns a price of PD along the domestic demand function, D-D. Thus the marketing board "gains" PD-PB on each unit sold domestically or an amount equal to area A on the domestic portion of total sales, about one third of the annual crop.

The balance of total supply (except for inventory change) is exported through private traders at the world price, PW. This is about two thirds of annual production and goes mainly to the United Kingdom and various Pacific islands. Since Australia supplies only about 2 percent of world rice exports, it is assumed here that she exerts no perceptible influence on world prices. The marketing board sustains a "loss" of PB-PW on each unit exported or an amount equal to area B on the export volume of Q2-Q1. Referring to areas A and B as "gains" or "losses" by the Rice Marketing Board is somewhat unrealistic since the final pooled price to growers for a given crop is settled only after the returns from both domestic and

Figure 2: Rice Policy, Australia



export sales are known. To the extent that PD, PW, and especially PB are approximately known in advance, the notion of "gains" and "losses" as used here is helpful in understanding the economics of this market discrimination scheme.

The backflow of imports into the higher-priced domestic market is discouraged by a tariff, but some long-grained rice imports do occur in small volumes. (It is assumed here that Australia would remain as a net exporter of rice, at least in the short run, under a free trade policy.)

To the extent that area A is equal to or larger than area B, the direct protective aspects of this two rice scheme are borne by Australian rice consumers through higher prices. Protection from fluctuations or a long-run decline in export prices are more limited with this type of scheme than with a price-support and export-subsidy program. A decrease in PW will tend to increase "losses" measured by area B. In order to maintain PB by means of market discrimination, PD would have to be increased (assuming that D-D is price inelastic). There is clearly an economic and political limit to this practice. Consequently, PB will have to move downward in the face of a severe or prolonged fall in PW.

The following tabulation contains approximate values of the annual quantities indicated on figure 2 for the average of 1969 and 1970 in Australia: (5)

| Item                        | Thousand metric tons<br>of milled rice |
|-----------------------------|--|
| Domestic disappearance (Q1) | 57                                     |
| Export (Q2-Q1)              | <u>117</u>                             |
| Total supply (Q2)           | <u>174</u>                             |



In summary, Australia rice policy protects domestic producers modestly by means of market discrimination between domestic and export outlets. State marketing board and irrigation agencies operate the policy. In return for some price and income protection, Australian producers are required to abide by production restrictions through acreage and irrigation water controls. Consumers in Australia pay higher prices for rice than under free market conditions.

### Japan

Rice policy in Japan is just as crucial to the status of the international rice market as U.S. policy even though Japan is just slightly more than self sufficient. This self-sufficiency in rice is a direct result of domestic policy which (a) provides farmers with high guaranteed prices, (b) insures a lower retail prices through a consumer subsidy, and (c) controls rice imports. (2, 7, 10) The critical role of rice as the traditional dietary staple in Japan lies at the heart of that nation's rice policy. The continuing political power of farmers and bitter memories of past food shortages underpin today's rice policy even in the face of mounting costs. Thus, Japan's successful drive for rice self-sufficiency is a mixture of economic and political forces which have a long and complex history. (7)

Figure 3 is a simple illustration of the economics of this complicated policy. A high level of price support, PS, is offered to Japan's paddy producers. At the moment, internal prices are more than twice as high as world prices, the latter indicated on figure 3 by PW. Even with high internal

rice prices, Japan was a net importer of rice as recently as 1967-68. But the inexorable movement of the domestic supply function, S-S, to the right as technology improved against a relatively static or declining domestic demand has moved Japan into a net surplus position. National policy is attempting to slow down this supply expansion by means of land diversion payments to producers who shift paddy land into other uses. These efforts are suggested by the arrows in figure 3.

The farm purchase and marketing of rice in Japan is controlled by the Food Agency of the Ministry of Agriculture.<sup>5/</sup> This agency buys the farm output, Q2, at the support price, PS. It regulates sales to consumers at PD, thus sustaining a loss equal to area A in figure 3. Even with this consumer subsidy, the amount demanded domestically, Q1, is short of the total amount produced, Q2.

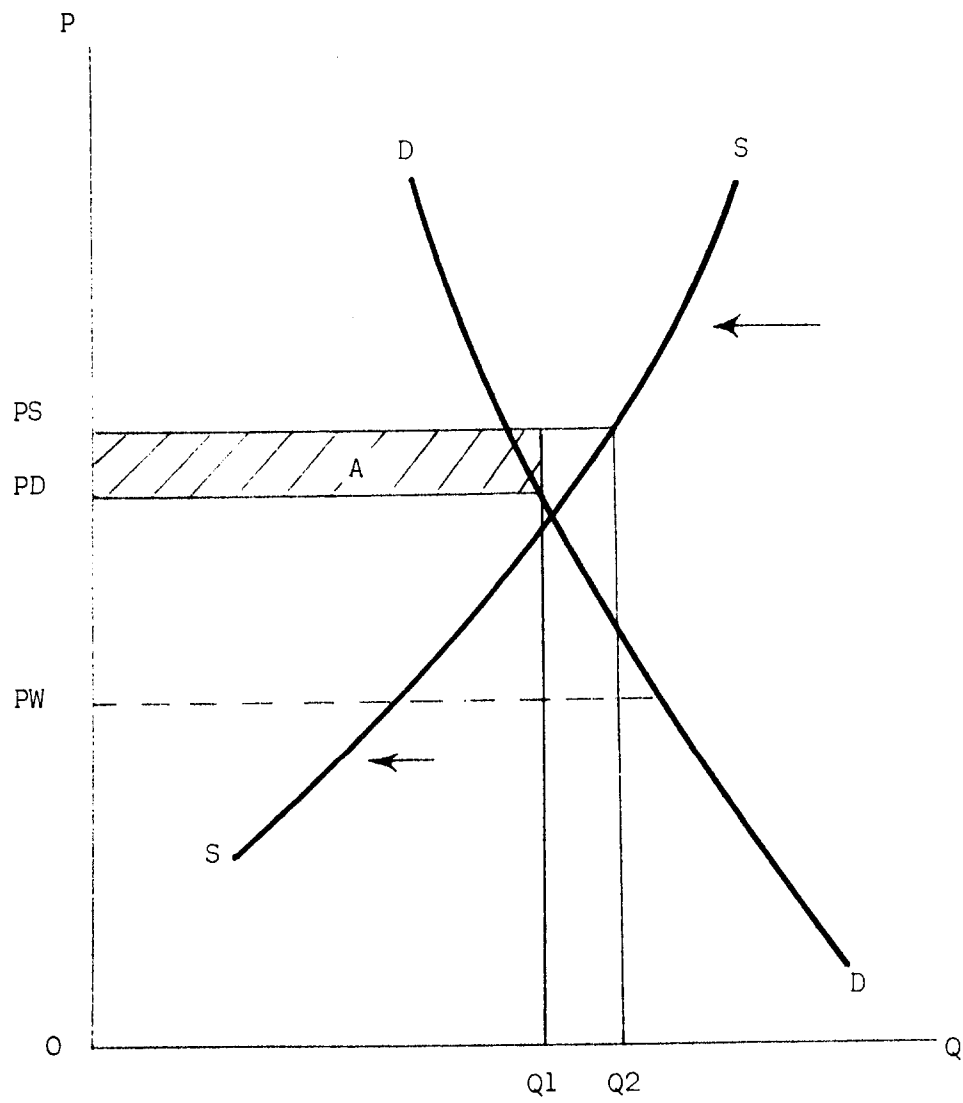
As the remarkable post-war growth of the Japanese economy has unfolded, rice has become much less important as a wage good. (7) Consequently, consumer rice prices have been increased relative to farm prices in recent years, although consumers are still subsidized. However, farm price guarantees for rice have been increased virtually every year since 1960. This program is quite expensive. At least 35-40 percent of the budget for agricultural administration is devoted to the support program for rice. (8)

The amount Q2-Q1 in figure 3 is available for export and inventory accumulation. Even though Japan is potentially a large importer of rice at current world prices, her actual imports and exports currently probably

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<sup>5/</sup> Some sales of rice outside the Food Agency are legally authorized and some sales occur through illegal channels. (8)

Figure 3: Rice Policy, Japan



have little direct impact on world prices. However, any major reduction in domestic production or domestic support prices could produce substantial upward pressure on world trade and prices.<sup>6/</sup>

As Japan moved beyond self sufficiency during the late 1960's inventories began to accumulate in government hands.<sup>7/</sup> Being sensitive to potential criticism from traditional rice exporters in Asia, the Japanese government did not attempt to dump the growing inventory on weakening commercial markets at PW. However, some exports are now occurring as concessional food aid shipments similar to P. L. 480 exports from the United States. Additionally, the government is moving some rice into feed uses and is attempting to expand industrial utilization.

The following tabulation, contains approximate values of the annual quantities shown in figure 3 for the average of 1969 and 1970: (5, 7, 11)

| Item                           | Thousand metric tons<br>of milled rice |
|--------------------------------|--|
| Domestic consumption (Q1)      | 9,950                                  |
| Net export and storage (Q2-Q1) | <u>1,316</u>                           |
| Total Production (Q2)          | 11,266                                 |

Level of stocks in 1970 (not shown on figure 3) 6,500

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<sup>6/</sup> Although not shown in figure 3, any change in Japan's rice import policy which involves substantial imports would surely bid world prices above PW. At price levels around the current PW. Japan would be a large net importer.

<sup>7/</sup> In 1970 for example, Japan's rice stocks were approximately equal to the level of world rice exports. (11)

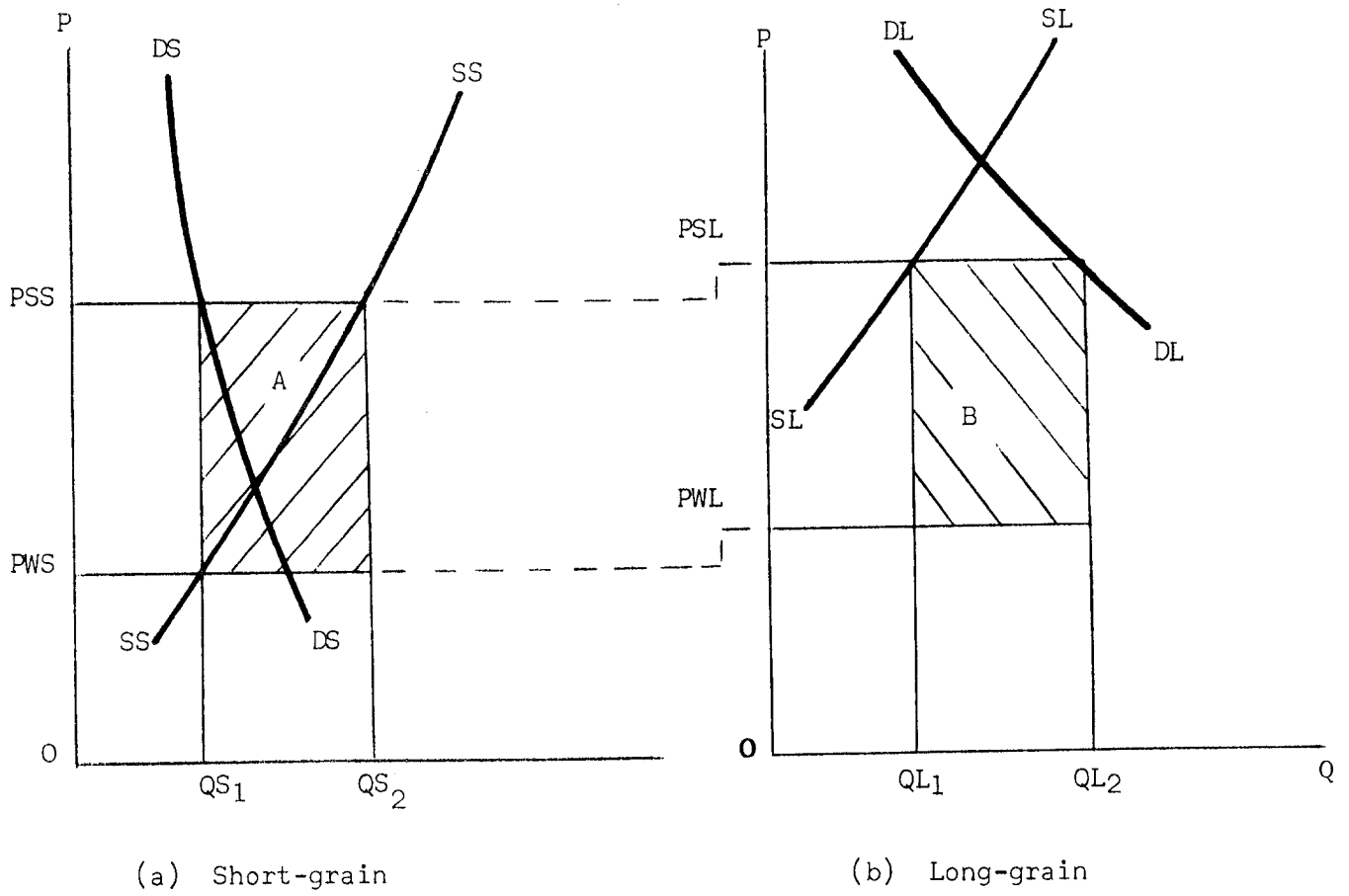
As the leading producer and consumer of rice among developed nations, Japan's rice policy is critical in determining the overall size and character of international rice markets. At the moment, it appears that Japan's goal of self-sufficiency has been achieved at a rather high cost to her consumers and taxpayers. Unless this policy is modified, Japan will probably remain a minor factor in the day-to-day conduct of world trade. But should current policies change, Japan has a great potential ability to absorb rice imports.

#### European Economic Community (EEC)

As a fairly sizeable importer of long-grain rice and exporter of short-grained rice, the EEC is important among developed nations in the world rice market. The EEC policy on rice is almost identical with its policies for other food and feed grains. (4, 15) The main features of this policy include rather high internal support prices to farmers protected by variable import levies on one hand and variable export subsidies on the other. No direct production controls or restraints are now in force, and rice moves freely within the EEC from one country to another.

It makes sense to divide the EEC market, into two parts in order to illustrate the economics of community rice policy. Part (a) of figure 4 illustrates the market for short-grained rice, and part (b) illustrates the market for long-grained rice. Look at figure 4 (a) first. The curve SS-SS is the EEC supply function for short-grained rice, produced largely in Italy and France; DS-DS is the EEC demand function for short-grained rice. At the community support or target price, PSS, more short-grained

Figure 4: Rice Policy, European Economic Community



rice is produced than is demanded within the EEC.<sup>8/</sup> The balance (QS2-QS1) is exported to third countries, mainly to nearby, non-EEC European nations. The difference between PSS and the lower world price, PWS, is made up by an export subsidy equal to PSS-PWS per ton on all shipments, or a total amount equal to area A in figure 4 (a). The export subsidy is subject to weekly adjustment and is designed to make EEC export rice competitive in nearby markets with rice from other sources.<sup>9/</sup>

Figure 4 (a) suggests that the EEC would be a net importer of short-grained rice at the world price level (the illustrated intersection of DS-DS and SS-SS occurs between PSS and PWS. This would probably be true if the EEC withdrew price guarantees for rice but did not alter its corn policy, since rice and corn compete for similar land and production resources inside the EEC. (15) As a matter of policy, however, corn and rice price supports are linked closely together in the ratio of about 1:1.5. (15) If PWS was achieved inside the EEC with corn prices also falling to maintain the ration, it is not clear what would happen to the community's rice output.

Next look at figure 4 (b) which is designed to illustrate the policy situation for long-grained rice. Here the EEC is in a net deficit position. At the internal price support rate of PSL (higher than PSS), more

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<sup>8/</sup> This particular discussion sidesteps the many complexities of target prices, intervention prices, threshold prices, etc. For more complete description of the mechanics of EEC rice policy see (4, 15). For this paper, PSS is simply a summary measure of internal support at the appropriate marketing level.

<sup>9/</sup> The EEC commission has much discretion in setting the export subsidy for different countries of destination.

is demanded by EEC consumers than is produced internally.<sup>10/</sup> The difference, (QL2-QL1), is imported from a number of third countries, mainly the United States and Thailand. The level of imports is controlled by the imposition of variable import levies which make up the difference between PSL and the appropriate c.i.f. import price, PWL. These import levies are calculated weekly and reflect both price and quality factors. The goal is to make imported rice inside the EEC no cheaper than domestically-produced rice, after quality factors are accounted for. The area B in figure 4 (b) indicates the total revenue generated by the import levies.

The EEC internal support prices for rice are not as high as those in Japan but still above world levels. Thus, EEC consumers pay more for both long- and short-grained rice than with free markets. Export subsidy losses on short-grained rice are offset by levy revenues on long-grained rice imports. As with most other farm products in the EEC, growers are not encumbered by direct output restrictions and, therefore, produce rice in excess of amounts that would be grown under free market conditions.

The following tabulation contains approximate values of annual quantities of all rice in the EEC for the average of 1969 and 1970. These data can be partially related to the volumes indicated on figure 4: (5, 13)

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<sup>10/</sup> Obviously the price for long-grain rice affects the position of the demand for short-grained rice and vice versa. The diagrams in figure 4 may be viewed as an equilibrium position after all short-run simultaneous adjustments have occurred.



| Item                           | Thousand metric tons<br>of milled rice |
|--------------------------------|--|
| Total production (QS2+QL1)     | 659                                    |
| Exports (QS2-QS1)              | 260                                    |
| Imports (QL2-Q11)              | <u>366</u>                             |
| Domestic utilization (QS1+QL2) | 765                                    |

#### Summary

The rice price and trade policies of the four developed nations discussed here display a variety of devices which insulate both producers and consumers from the full force of international competition. Among the exporters, the United States employs direct price supports, acreage controls, commercial export subsidies, and concessional food aid exports. Australia, a net exporter, utilizes a two price, market discrimination scheme featuring higher domestic prices, lower export prices, and an intermediate pooled price to farmers which is modestly above world price levels. Acreage and irrigation water restrictions limit the amount produced in Australia.

Japan, the largest producer and consumer of rice among the developed nations, protects domestic rice growers with very high guaranteed prices and only a limited land diversion program to control output. Consumers are subsidized to some extent and a program of special food aid exports has recently begun. The European Economic Community, a net importer, utilizes farm price guarantees protected by variable import levies and

variable export subsidies to insulate both farmers and consumers from world markets.

These diverse programs produce several common effects:

- 1) Prices paid to rice farmers are generally higher than they would be in the absence of the protective programs.
- 2) Prices paid by consumers are higher and, therefore, quantities demanded somewhat lower than without the programs.
- 3) Rice production is probably higher in the developed nations than it would be otherwise.<sup>11/</sup> Consequently, exports are higher and imports smaller.
- 4) Larger exports and smaller imports by developed nations suggest that trade opportunities for other rice producers, like Thailand, are smaller than they otherwise would be.

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<sup>11/</sup> An abandonment of output control programs in United States and Australia might offset some of the production-reducing effects of lower farm prices.

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